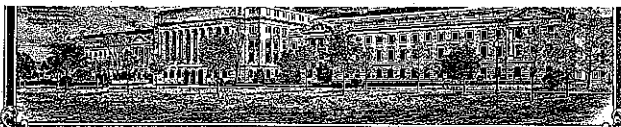


No.

200100236



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Board of Regents, University of Nebraska

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

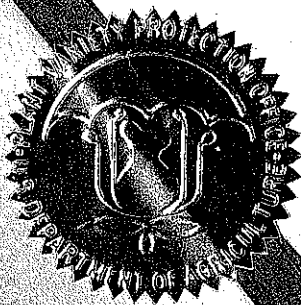
AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE VARIETY. STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Millennium'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirtieth day of January, in the year two thousand two.



Attest

P. M. Zerkel

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

W. G. ...

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Board of Regents, University of Nebraska		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME NE94479		3. VARIETY NAME Millennium	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Lincoln, NE 68583-0745		5. TELEPHONE (include area code) 402-472-7211		FOR OFFICIAL USE ONLY PVPO NUMBER 200100236	
6. FAX (include area code) 402-472-7904		7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		8. IF INCORPORATED, GIVE STATE OF INCORPORATION Nebraska	
9. DATE OF INCORPORATION February 15, 1869		10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. Darrell W. Nelson, Dean and Director Agricultural Research Division, IANR-UNL Lincoln, NE 68583-0704		FILING AND EXAMINATION FEES: \$ 3025.00 DATE 8/1/2001 CERTIFICATION FEE: \$ 320.00 DATE 1-22-02	
11. TELEPHONE (include area code) 402-472-2045	12. FAX (include area code) 402-472-9071	13. E-MAIL DNELSON@unl.edu	14. CROP KIND (Common Name) Bread Wheat		
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) 			19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no," go to item 22)		
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)			21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1, 2, 3, etc. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)		
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER <i>Darrell W. Nelson for</i> <i>University of Nebraska Board of Regents</i> NAME (Please print or type) DARRELL W. NELSON			SIGNATURE OF OWNER NAME (Please print or type)		
CAPACITY OR TITLE Dean and Director, Agr Research Division		DATE 7/6/01		CAPACITY OR TITLE _____	
DATE		DATE		DATE	

INSTRUCTIONS

200 100236

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,450 (\$300 filing fee and \$2,150 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

ITEM

- 18a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

September 2000 - First sale of certified seed

September 1999 - First allocation of foundation seed of unrelated cultivar with intent to increase for public sale

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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S&T-470 (5-98) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete.

2

Millennium (PI 613099) Hard Red Winter Wheat Application

Exhibit A. Origin and Breeding History

Millennium was selected from the cross 'Arapahoe'/'Abilene'//NE86488, which was made in 1988. The pedigree of NE86488 is 'Colt'/'3'/'Warrior' 5*/'Agent'/'Kavkaz'. The F₁ to F₃ generations were advanced using the bulk breeding method. Millennium is an F₃-derived line that was selected in the F₄ generation. The F₁ generation was grown in the greenhouse in 1988. The F₂ and F₃ generations were grown in bulk at the Agricultural Research and Development Center at Ithaca, Nebraska in 1990 and 1991, respectively. Random heads were chosen from the F₃ bulk and planted as head rows which were harvested in 1992. The F₃-derived F₅ family was harvested as a single observation plot in 1993. Millennium was identified as NE94479 and was grown at six unreplicated locations in 1994. It has been tested in replicated trials at seven locations per year from 1995 to present. In addition, Millennium was evaluated as NE94479 in the USDA-ARS Uniform Winter Wheat Northern Regional Performance Nursery (NPRN) in 1997 and 1998, and in Nebraska cultivar performance trials in 1998 and 1999. The criteria for selection were: a) adequate winterhardiness for propagation in Nebraska, b) resistance to *Puccinia graminis* (the causal agent of stem rust), c) agronomic performance equal to or superior to commonly grown wheat varieties, and d) acceptable end-use quality (in this case for bread making). Millennium was released primarily for its superior and broad adaptation to rainfed wheat production systems in Nebraska (except southeastern Nebraska) and similar growing areas in South Dakota and adjacent states. Millennium was named and officially released in April, 1999 by the Nebraska Agricultural Experiment Station and the Agricultural Research Service, U.S. Department of Agriculture. The first public sale of Certified seed was September, 2000. Millennium will be maintained by the Nebraska Agricultural Experiment Station with the following classes: Breeder, Foundation, Registered, and Certified. By agreement with the Nebraska Crop Improvement Certification standards, Registered seed is nonsalable. Breeder seed will be maintained by roguing Breeder Seed fields. The U.S. Department of Agriculture will not have seed for distribution.

In observations over six generations of selfing and during seed increase, Millennium has been uniform and stable since 1998. Less than 0.5 % of the plants were rogued from the Breeder's seed increase in 1998. The rogued variant plants were taller in height (10 - 15 cm), or were awnless with red chaff. Up to 1% (10:1000) variant plants may be encountered in subsequent generations.

Exhibit B. Novelty Statement

To our knowledge, Millennium most nearly resembles in appearance the hard red winter wheat cultivar, Arapahoe, but can be distinguished by the following characteristics:

1. Arapahoe has pubescent leaves whereas Millennium has glabrous leaves.
2. Using microsatellite data from the USDA genotyping center at Kansas State University (contact persons: Drs. Kristi Hill-Ambroz and Gina Brown-Guedira), Arapahoe and Millennium can be separated using microsatellite gmw533. Using gwm533 Arapahoe

has allele 173 while Millennium is heterogenous for alleles 114 and 136.

Exhibit C. See Attached Sheet.

Exhibit D. Additional Description of the Variety.

Millennium is an awned, white-glumed cultivar. Its field appearance is most similar to 'Arapahoe'. After heading, the canopy is moderately open and upright. The flag leaf is erect and twisted at the boot stage. The foliage is green with a waxy bloom at anthesis. The leaves are glabrous. The spike is oblong in shape, long, and middense. The glume is long and midwide, and the glume shoulder is square. The beak is medium in length with an acuminate tip. The spike is usually nodding at maturity. Kernels are red colored, hard textured, midlong, and ovate in shape. The kernel has no collar, a midsize brush of medium length, rounded cheeks, midsize germ, and a narrow and mid-deep crease.

Millennium was evaluated as NE94479 in Nebraska yield nurseries starting in 1995, in the USDA-ARS Uniform Winter Wheat Northern Regional Performance Nursery (NRPN) in 1997 and 1998, and in Nebraska cultivar performance trials in 1998 and 1999. In two years (26 environments) of testing in Nebraska cultivar performance trials, it has performed well throughout most of Nebraska, but it is best adapted to southwestern and western Nebraska. The average rainfed yield of Millennium was 4200 kg ha⁻¹, which compares favorably to 'Alliance' (4150 kg ha⁻¹), 'Culver' (4190 kg ha⁻¹) and 'Niobrara' (4160 kg ha⁻¹). Millennium also performed well under irrigation (5760 kg ha⁻¹), though would not be considered a high management wheat due to its being a tall semi-dwarf with moderate straw strength (e.g. in three irrigated environments, Millennium was 16% lodged compared to 0% for 'Cougar', 2% for 'Wesley', 6% for '2137', and 32% for Arapahoe). In the NRPN, Millennium ranked 9th of 35 entries in 1997 and 9th of 28 entries in 1998 and averaged 320 kg ha⁻¹ higher yielding than 'Abilene' (3760 kg ha⁻¹).

Other measurements of performance from comparison trials show that Millennium is medium in maturity (141 d after Jan.1, data from observations in NE), about 0.5 d later flowering than Arapahoe and 2 d later than Alliance. It has a shorter length coleoptile, shorter than 'TAM 107' and Arapahoe. The mature plant height of Millennium (88 cm) is similar to Niobrara and one cm taller than Arapahoe. In rainfed production systems (26 Nebraska environments), Millennium (9%) is similar to Wesley (9%), and superior to Alliance (19%) and Arapahoe (19%) for lodging scores. The winterhardiness of Millennium is good to very good, similar to Abilene (data from NRPN) and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska.

Millennium is moderately resistant to stem rust (caused by *Puccinia graminis* Pers. : Pers. f. sp. *tritici* Eriks & E. Henn; most likely containing *Sr6* and *Sr24*; data provided by D. McVey at the USDA Cereal Disease Laboratory), leaf rust (caused by *P. tritricina* Erikss.; most likely contains *Lr24*, *Lr10*, and possibly *Lr16*; data provided by D. McVey at the USDA Cereal Disease Laboratory), and Hessian fly (*Mayetiola destructor* Say, similar to Arapahoe, and most likely contains the Marquillo-Kawvale genes for resistance; data provided by J. Hatchett, USDA and Kansas State University), and susceptible to wheat soilborne mosaic virus, and barley yellow

dwarf virus (data obtained from the Uniform Winter Wheat Northern Regional Performance Nursery, 1998-1999, and field observations in NE). In preliminary field tests, Millennium has exhibited a low level of tolerance to wheat streak mosaic virus (data provided by G. Hein from field observations in NE). Millennium has a good grain volume weight (76.5 kg hl^{-1}) and is higher than Arapahoe (75.4 kg hl^{-1}), Niobrara (75.4 kg hl^{-1}), and Culver (75.4 kg hl^{-1}), but lower than Pronghorn (77.8 kg hl^{-1}).

The milling and baking properties of Millennium were determined for five years by the Nebraska Wheat Quality Laboratory. In these tests, Arapahoe and 'Scout 66' were used as check cultivars. The average grain and flour protein concentration of Millennium (124 and 109 g kg^{-1}) was lower than Arapahoe (130 and 117 g kg^{-1}) and Scout 66 (124 and 118 g kg^{-1}). The average flour extraction on the Buhler Laboratory Mill for Millennium (727 g kg^{-1}) was similar to Scout 66 (729 g kg^{-1}), and higher than Arapahoe (720 g kg^{-1}). The flour ash content (40 g kg^{-1}) was similar to the check cultivars. Dough mixing properties of Millennium were weaker than Arapahoe and stronger than Scout 66. Average baking absorption was slightly less than the check cultivars. The average loaf volume of Millennium (909 cm^3) was similar to Arapahoe (905 cm^3) and greater than Scout 66 (881 cm^3). The scores for the internal crumb grain and texture were good, which was similar to Arapahoe, but less than Scout 66. The overall end-use quality characteristics for Millennium should be acceptable to the milling and baking industries.

Exhibit E. Statement of the Basis of the Applicant's Ownership

The University of Nebraska is the applicant for protection in the case of Millennium hard red winter wheat being the variety for which Plant Variety Protection is hereby sought was developed by Drs. P.S. Baenziger and D. Shelton, employees of the University of Nebraska and C. J. Peterson, an employee of the USDA-ARS. By agreement between employees of the University of Nebraska and by agreement between USDA-ARS and the University of Nebraska, all rights to any variety made by employees while employed by the University of Nebraska or by the USDA-ARS employees stationed at the University of Nebraska are assigned to the University of Nebraska, with no rights of any kind to Millennium being retained by the employees.

Actual count of variants: 6 tall plants (7 to 10 cm) per 4000
Less than 1 awnless plant per 10000
Less than 1 bronze chaff plant per 10000

Done on 7/3/01 at Mead

Microsatellite Information for Wahoo & Millenium

Primer Pair: gwm 533 (Roder, et al, 1998)
5' AAG GCG AAT CAA ACG GAA TA
3' GTT GCT TTA GGG GAA AAG CC

Dates Samples were Run: 3-30-01 and 8-01-01
Both dates produced same data

Run by Colleen Truman, USDA-ARS Genotyping facility

Procedure similar to Roder et al, 1998.

Röder, M.S., V. Korzun, K. Wendehake, J. Plaschke, M.H. Tixier, P. Leroy, and M.W. Ganal. 1998. A microsatellite map of wheat. Genetics 149:2007-2023

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) Board of Regents, University of Nebraska ADDRESS (Street and No. or RD No., City, State, and Zip Code) Lincoln, NE 68583-0745	FOR OFFICIAL USE ONLY
	PVPO NUMBER 200100236
	VARIETY NAME Millennium
	TEMPORARY OR EXPERIMENTAL DESIGNATION

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

1=Common 2=Durum 3=Club 4=Other (SPECIFY):

2. VERNALIZATION:

1=Spring 2=Winter 3=Other (SPECIFY):

3. COLEOPTILE ANTHOCYANIN:

1=Absent 2=Present

4. JUVENILE PLANT GROWTH:

1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):

1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):

1 = Erect 2 = Recurved 1 = Not Twisted 2 = Twisted

7. EAR EMERGENCE:

Number of Days Earlier Than Arapahoe *

Number of Days Later Than ALLIANCE *

8. ANTER COLOR:

1 = Yellow

2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

cm Taller Than ARAPAHOE *cm Shorter Than NIOBRARA *

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

1 = Absent

2 = Present

B. WAXY BLOOM

1 = Absent

2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent

2 = Present

D. INTERNODE (SPECIFY NUMBER)

1 = Hollow

2 = Semi-solid

3 = Solid

E. PEDUNCLE

1 = Absent

2 = Present

cm Length

11. HEAD (at Maturity):

A. DENSITY

1 = Lax

2 = Middense

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (SPECIFY):

oblong

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES (at Maturity):

A. COLOR

1 = White

2 = Tan

3 = Other (SPECIFY): _____

C. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

D. LENGTH

1 = Short

2 = Medium

(ca. 7mm)

(ca. 8mm)

3 = Long (ca. 9mm)

12. GLUMES (at Maturity) *Continued*:

200100236

E. WIDTH

- ☒ 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm)
3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

- ☒ 1 = Ovate 2 = Oval 3 = Elliptical

B. CHEEK

- ☒ 1 = Rounded 2 = Angular

E. Color

- ☒ 1 = White 2 = Amber 3 = Red
4 = OTHER (Specify)

F. TEXTURE

- ☒ 1 = Hard 2 = Soft

C. BRUSH

- ☒ 1 = Short 2 = Medium 3 = Long
☒ 1 = Not Collared 2 = Collared

D. CREASE

- ☒ 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel
☒ 2 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

G. PHENOL REACTION (see instructions):

- ☐ 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

- | | |
|--|--|
| <input checked="" type="checkbox"/> 2 Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>)
TMNK | <input checked="" type="checkbox"/> 2 Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>)
FIELD STRAINS |
| <input type="checkbox"/> Stripe Rust (<i>Puccinia striiformis</i>) | <input type="checkbox"/> Loose Smut (<i>Ustilago tritici</i>) |
| <input type="checkbox"/> Tan Spot (<i>Pyrenophora tritici-repentis</i>) | <input type="checkbox"/> Flag Smut (<i>Urocystis agropyri</i>) |
| <input type="checkbox"/> Halo Spot (<i>Selenophoma donacis</i>) | <input type="checkbox"/> Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) |
| <input type="checkbox"/> <i>Septoria nodorum</i> (Glume Blotch) | <input type="checkbox"/> Dwarf Bunt (<i>Tilletia controversa</i>) |
| <input type="checkbox"/> <i>Septoria avenae</i> (Speckled Leaf Disease) | <input type="checkbox"/> Karnal Bunt (<i>Tilletia indica</i>) |
| <input type="checkbox"/> <i>Septoria tritici</i> (Speckled Leaf Blotch) | <input type="checkbox"/> Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> Scab (<i>Fusarium</i> spp.) | <input type="checkbox"/> "Snow Molds" |

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

- | | |
|---|---|
| <input type="checkbox"/> "Black Point" (Kernel Smudge) | <input type="checkbox"/> Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input checked="" type="checkbox"/> Barley Yellow Dwarf Virus (BYDV)
FIELD STRAINS | <input type="checkbox"/> Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input checked="" type="checkbox"/> Soilborne Mosaic Virus (SBMV)
FIELD STRAINS | <input type="checkbox"/> Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input type="checkbox"/> Wheat Yellow (Spindle Streak) Mosaic Virus | <input type="checkbox"/> Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input checked="" type="checkbox"/> Wheat Streak Mosaic Virus (WSMV)
SIDNEY ISOLATE &
FIELD STRAINS | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Hessian Fly (<i>Mayetiola destructor</i>)
GREAT PLAINS BIOTYPE | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Stem Sawfly (<i>Cephus</i> spp.) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Cereal Leaf Beetle (<i>Oulema melanopa</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Russian Aphid (<i>Diuraphis noxia</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Greenbug (<i>Schizaphis graminum</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Aphids | <input type="checkbox"/> Other (SPECIFY) |

16. Does the variety contain any genetic material introduced (into this variety or a parent) using the biotechnology techniques of cloning and genetic transformation? (I.e. "genetic transformation")?

☐ Yes ☒ No

17. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Board of Regents, University of Nebraska	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER NE94479	3. VARIETY NAME Millennium
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Lincoln, NE 68583-0745	5. TELEPHONE (include area code) 402-472-7211	6. FAX (include area code) 402-472-7904
7. PVPO NUMBER 200100236		

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO
If no, give name of country10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

SEE ATTACHED**PLEASE NOTE:**

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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